A Green Infrastructure Plan

to Restore, Connect, and Protect South Carolina's Habitats

Planning for Green Infrastructure involves protecting and connecting the natural and cultural assets of the Pee Dee region.

Green Infrastructure Center

March 2023

Prepared for the state of South Carolina by the Green Infrastructure Center
Funded by the South Carolina Forestry Commission and the USDA Forest Service, Southern Region

Executive Summary

The Pee Dee Council of Governments (COG) region contains diverse natural and cultural resources, from the Great Pee Dee River to historic plantations and churches. The region is predominantly rural, with development and continued growth along the I-95 highway corridor. While economic prosperity is very important to the communities in this region, it is vital to grow in patterns that conserve the region's natural resources and habitats. Continuation of local efforts to conserve land, create regional partnerships, and establish both ordinances and planning guidance for growth that protects green infrastructure will ensure the high quality of life of the Pee Dee region for future generations.

The Pee Dee COG region is on the central eastern edge of the state bordering North Carolina, and is bounded on the west by the Lynches River, the south by the Little Pee Dee River, and on the north and east by North Carolina. It encompasses the counties of Chesterfield, Marlboro, Darlington, Dillon, Marion, and Florence. The Pee Dee region includes forests, wetlands, blackwater rivers, lakes, and farms. Florence and Darlington are growing counties, while Chesterfield, Marlboro, Dillon, and Marion remain predominantly rural counties. Carolina Sand Hills National Wildlife Refuge, botanical gardens, and historic plantations contribute to a sense of place. Approximately 8% of the land in the Pee Dee COG region is protected in several state parks, national wildlife refuges, wildlife management areas, and other open spaces.

This region is the ancestral home of the Pee Dee, Catawba, Cheraw, and Lumbee Native Peoples.* The Catawba Nation is the only federally recognized tribe currently in South Carolina and has a reservation in the Catawba COG region. The Pee Dee Indian Nation of Upper South Carolina and Pee Dee Indian Tribe are state recognized native groups living in this region today.

The Pee Dee region includes forests, wetlands, blackwater rivers, lakes, and farms.

Green Infrastructure Planning Process

This Green Infrastructure Plan comprises a set of maps and strategies for conserving and restoring a connected landscape in the state. GIC led the Pee Dee COG and local stakeholders though GIC's Six-Step Green Infrastructure Planning Process with a series of four workshops from 2021-22. This process involved mapping habitats cores and corridors, as well as existing natural and cultural assets, followed by risk analysis to inform strategies for action. With these data, local stakeholders determined priority areas for conservation in the region, as well as strategies to ensure a connected landscape into the future. GIC followed regional COG workshops with state agency engagement. The resulting statewide plan includes state priorities informed by regional priorities.

This COG chapter will appear as a separate document, distinct from the full report, since it is one of ten COG chapters that have been included in the statewide assessment. The full report can be found here: https://scgiplan-gicinc.hub.arcgis.com/ or at www.gicinc.org or https://www.scfc.gov/management/urban-forestry/

The statewide scale of this project did not allow GIC to drill down to the level of county and city green infrastructure plans, but did establish important priorities for each region.

1. In the first workshop, GIC presented an overview of the project and shared a map of the region's ranked habitat cores. Feedback on the accuracy of the map and areas of development were noted and incorporated.

2. In the second workshop, GIC presented themed overlay maps that showed the region's agricultural soils, water resources, recreation, and cultural assets and asked workshop attendees to add their local input on additional assets, such as historic plantations or churches. The final Pee Dee asset maps and dataset included new data recommended by participants.

Pee Dee FAST FACTS

2,279,680 acres– total COG area (3,562 mi²)

1,057,280 acres– of habitat cores (1,652 mi²)

46% of COG land area is habitat cores

160,000 acres– of protected cores (250 mi²)

15% of habitat cores are protected

188,160 acres– area of protected land (cores and other) (294 mi²)

8% of total area are protected land

49,920 acres– area of public parkland (78 mi²)

2% of total land is public parkland

500,480 acres– area of habitat cores with known cultural/archaeological resources (782 mi²)

437,760 acres– area of habitat cores with highest value ranking (top 5th) (684 mi²)

152,320 acres– area of habitat cores that intersect a groundwater protection zone (238 mi²)

646,400 acres– area of prime agricultural soils on open land (1,010 mi²)

52,480 acres of wetlands (82 mi²)

1,852 mi of 2,683 mi (69%)– miles of streams that flow within a habitat core

343 of 1,179 (29%)– of habitat cores support cultural or recreational assets

154 of 1,179 (13%)– of habitat cores support known rare, threatened, or endangered species

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3. In the third workshop, GIC presented draft maps of risks to habitat cores in the region, including development, utility-scale solar development, and impaired waters. Stakeholder feedback about these risks was used to update and finalize the risk maps.

4. In the fourth and final workshop, GIC shared a strategy map that showed ranked habitat cores, protected lands, and regional corridors. The stakeholders then considered priority habitats and risks to those assets and recommended strategies to reduce or prevent impacts to high-value resources.

6-Step Green Infrastructure Planning Process

1. Set Your Goals What does your community value?

2. Review Data What do we know or need to know, to map identified values? Combine the state modeled data with local data.

3. Map Your Community's Ecological and Cultural Assets Based on the goals established in Step 1 and data from Step 2.

4. Assess Risk What assets are most at risk and what could be lost, if no action was taken?

5. Rank Assets and Determine Opportunities Based on those assets and risks you have identified, which ones should be restored or improved?

6. Implement Opportunities Include natural asset maps in both daily and long-range planning (park planning, comp plans, zoning, tourism and economic development, seeking easements etc.)

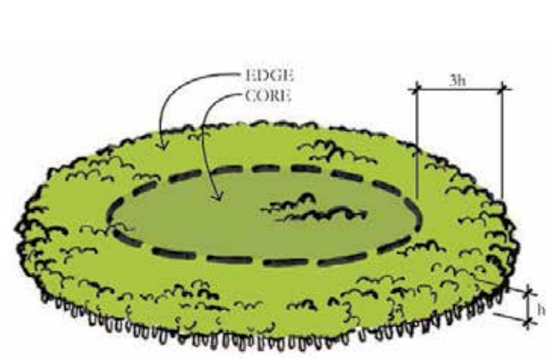
Habitat Cores

Habitat cores are intact areas of the landscape that provide adequate habitat to support native species and were modeled using source data from the 2019 National Land Cover Dataset. Habitat cores are forests, forested wetlands, and marshes at least 100 acres or more in size and are ranked using additional attributes such as water richness, topography, and the presence of rare, endangered, or threatened species. This size is large enough to provide adequate foraging and nesting habitat for interior forest dwelling birds and to support a range of other wildlife species.

Habitat cores encompass 46% of Pee Dee COG land area.

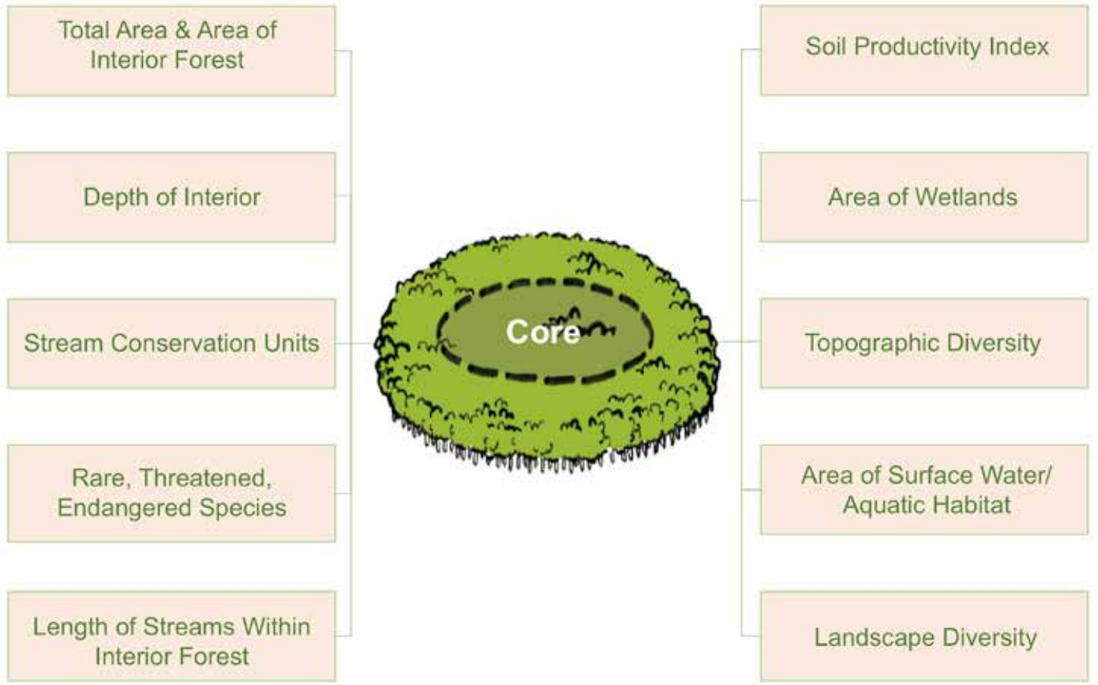
For more on how habitat cores are created, see the Methods and Maps section (page 7) and the Technical Appendix of the full report.

Ranking cores for the values they provide allows land-use planners, agency officials, and site managers to prioritize those specific habitat cores that best meet management goals and objectives, while providing the highest value for species.



Habitat cores consist of an area of intact interior wildlife habitat of 100 acres or more and an edge area that serves as a buffer absorbing impacts from outside the core.

Habitat cores are ranked based on these ecological metrics.

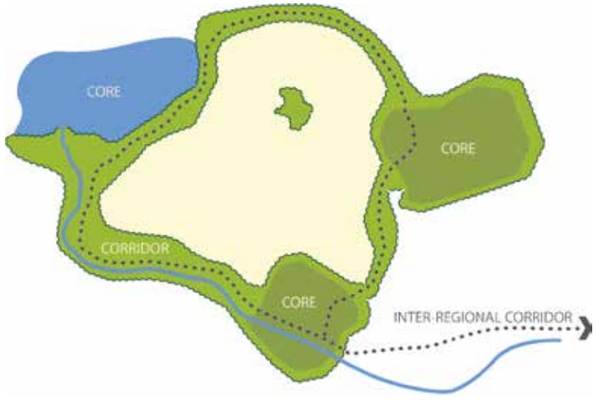


GIC modeled and mapped ranked habitat cores across both the region and state, based on ecological metrics, *see chart above*.

Corridors

Wildlife moves between habitat cores along corridors that support biodiversity by allowing species to move across the landscape and repopulate areas following such disturbances as hurricanes or fires. Restoration or preservation of corridors may also present opportunities to incorporate trails for human recreation. In addition to regional corridors, GIC modeled corridors that are of statewide importance. A graphic representation of this connectivity is displayed on the maps as state and local corridor lines. As the region continues to grow, every effort should be made to continue to maintain these corridors for a more connected and resilient landscape.

For more on corridor modeling see the Introduction section (pages 10 and 11) and the Technical Appendix of the full report.



Green Infrastructure planning is about connecting the landscape. Corridors provide connections between core habitats. A well-connected landscape is more resilient.

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Assets

Natural Assets are the environmental elements that provide healthy surroundings, recreational opportunities, and clean water and food for both people and wildlife. These natural assets include forests, waterways, wetlands, bays, agricultural soils, and other natural resources. *Cultural Assets* are the landscape elements or uses that people value, such as parks, boat landings, trails, historic or archaeological sites, or scenic vistas and roads that add to the beauty of the area. Natural assets support cultural assets by providing scenic backdrops to historic sites, buffering them from storms and providing settings in which to enjoy them, such as the trails through historic sites that engage visitors in history while they enjoy the natural surroundings. GIC mapped these assets using existing state and national datasets, as well as data from stakeholders. The asset maps include water, agriculture, recreation, and cultural assets. Locating these assets is the first step in protecting them and allows decision-makers and planners to make more informed decisions about growth and conservation.

Risks

Mapping important habitats, agricultural soils, and cultural sites is only a first step towards planning to conserve important assets into the future. Mapping risks, in order to understand which assets are most vulnerable is the next step. GIC analyzed the following risks across the state: sea level rise, storm surge, impaired waters, development, and solar development. These risk maps can be used to determine most critical regional risks and priority areas for conservation. Impaired waters maps can be used to determine areas to target for riparian plantings. Development and solar development maps can guide conservation efforts, as well as planning policy. Tools to mitigate risk can also include establishing solar ordinances, or drawing urban growth boundaries to avoid high-value habitat cores.

Pee Dee Risks

23 of 1,179 (2%) habitat cores with **impaired streams**

125 of 1,179 (10%) habitat cores at risk of **development**

965 of 1,179 (82%) habitat cores at risk of **solar development**

932 of 1,179 (79%) habitat cores at **cumulative risk**

Prime agricultural soils are abundant in the region, with higher concentrations in Marlboro, Dillon, and Darlington counties.

Regional Observations

The Pee Dee region's highest quality habitat cores are found in and around Carolina Sandhills National Wildlife Refuge, along the Great Pee Dee River Corridor, the Lynches River Corridor, and the Little Pee Dee River Corridor. The larger wildlife corridors in the region follow the Lynches, Great Pee Dee, and Little Pee Dee River. Corridors and connectivity can be ensured or restored by maintaining and planting buffers and seeking protection along these rivers. Prime agricultural soils are abundant in the region, with higher concentrations in Marlboro, Dillon, and Darlington counties. The region supports nature-based recreational assets, such as paddling a scenic river, hiking in a National Wildlife Refuge, and fishing or boating on a lake. The assets highlighted in the maps are the result of participation by stakeholders, so those counties that participated in the process are likely to see more assets represented on the maps.

Protected land makes up 8% of the total area in the Pee Dee COG, which is below the statewide rate of 14%. The Governor has adopted the 30 by 30 goal to preserve 30% of the state by 2030. To achieve this goal, the region will need to more than triple its protected lands and should continue to work with the Pee Dee Land Trust and other organizations to protect high-value habitat cores and corridors in the region. Currently, 15% of regional habitat cores are protected and the habitat cores and corridors map shows the most important lands that still need protection. Public parkland in the region is 2% of the total area, well below the 5% statewide rate. South Carolina Parks Recreation and Tourism and local governments should prioritize more high-quality public park space in the region and habitat cores should be a key consideration for locating future parkland.

The greatest risk for the region is development, especially suburban sprawl-patterned growth and utility scale solar development. Urban development risks are greatest along the I-95 corridors, as well as in Darlington and Marlboro counties. Additionally, habitat cores and prime agricultural soils across the region are at risk of development for utility-scale solar farms. Planning for smart, compact growth will be critical to maintain habitat connectivity, food production capability, and quality-of-life in the region.

Regional Stakeholders

Participants in the Pee Dee stakeholder workshops include representatives from:

- Pee Dee Council of Governments
- Chesterfield County
- Darlington County
- Florence County
- Town of Cheraw
- Town of Lamar
- Town of Olanta
- Pee Dee Land Trust
- Francis Marion University
- US Fish and Wildlife Service
- SC Forestry Commission

Riparian buffers clean and protect rivers that provide recreation opportunities and drinking water.

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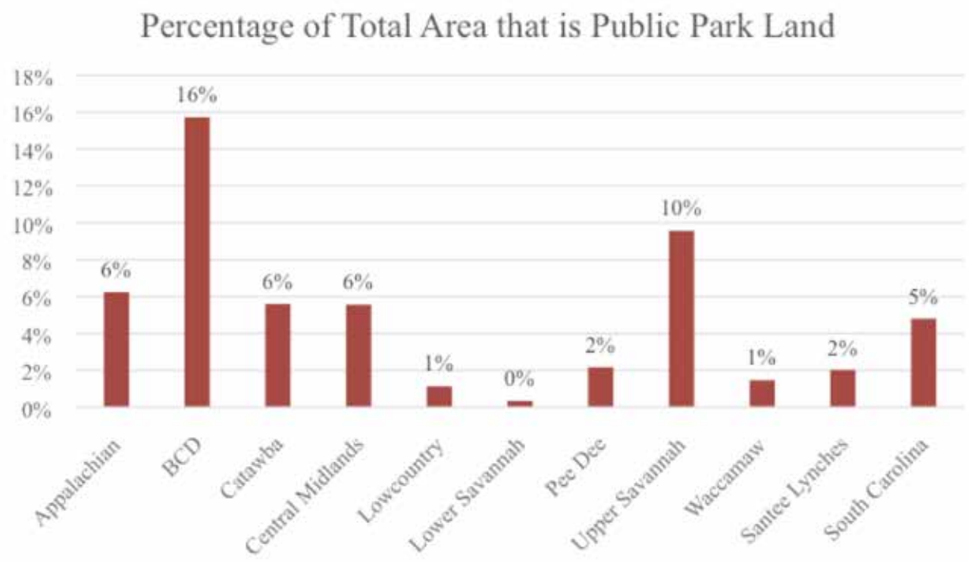
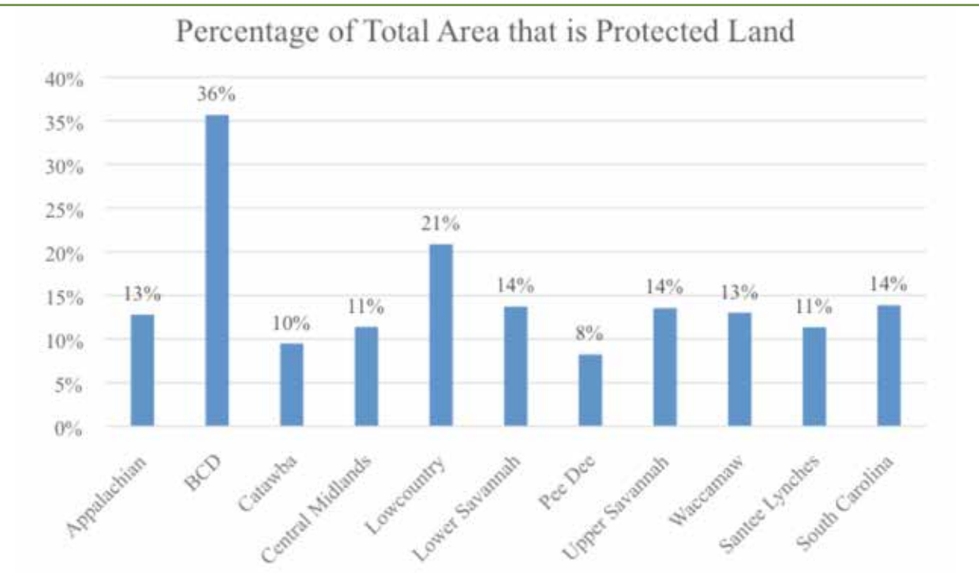


The percentage of public parkland in the Pee Dee region is 2%, well below the 5% statewide rate.



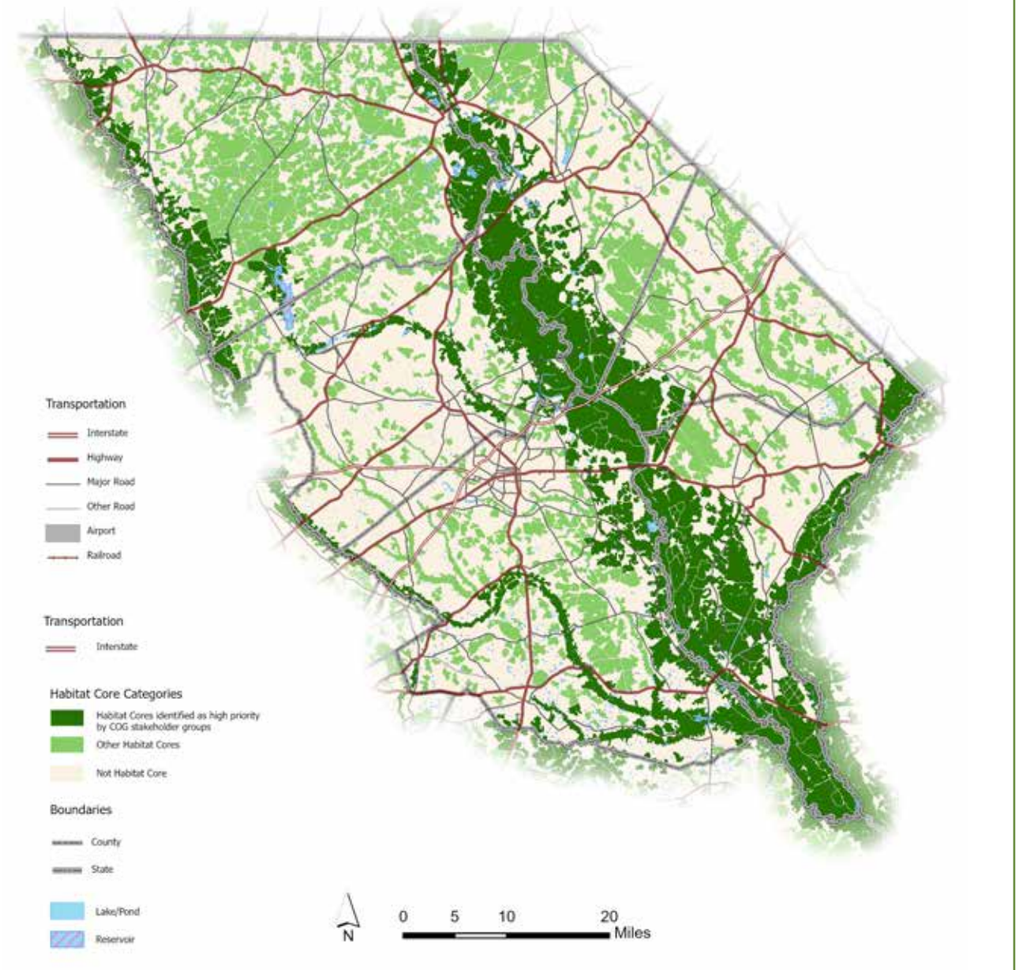
The percentage of protected land in the Pee Dee region is 8%, well below the 14% statewide rate.

Pee Dee Priority Areas

Pee Dee stakeholders identified several areas in the region that are priorities for protection and restoration.

- Protect and restore the Great Pee Dee River Basin.
- Protect and restore Black Creek in Darlington County.
- Protect and restore the Little Pee Dee River Corridor.
- Protect and restore the Lynches River Corridor for improved water quality and wildlife habitat. Collaborate on these actions with the Santee Lynches COG.
- Prioritize creation of conservation easements in Florence County.

Pee Dee COG Priority Areas Map



This map illustrates the habitat cores corresponding to the COG identified priority areas for protection and restoration.

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Pee Dee Strategies

Project maps to inform these strategies can be found at the end of this chapter as well as on the project HUB site https://scgiplan-gicinc.hub.arcgis.com/ Users can access all the data online and download data for any county.

Strategy 1: Implement a Green Space Sales Tax.

Chesterfield, Marlboro, Darlington, Dillon, Marion, and Florence counties should consider placing the Green Space Sales Tax on their ballots to raise funds to conserve more land. Counties can use the funds collaboratively to protect land across county boundaries. Pee Dee Land Trust is encouraging counties to pursue the tax.

Strategy 2: Create and strengthen solar ordinances.

Create solar ordinances in Chesterfield, Marlboro, Dillon, and Marion counties. Strengthen solar ordinances in Florence and Darlington counties. The South Carolina Energy Office has resources for creating or updating solar ordinances and model solar ordinances.

Strategy 3: Use data and maps in the Chesterfield Comprehensive Plan update.

Utilize data and maps from this Green Infrastructure Plan in the upcoming Chesterfield County Comprehensive Plan update, with a focus on protecting natural assets.

Next Steps

The data created for this plan are a foundation upon which to build a detailed local Green Infrastructure Plan. Any municipality or county wishing to pursue a more detailed local plan should contact GIC.

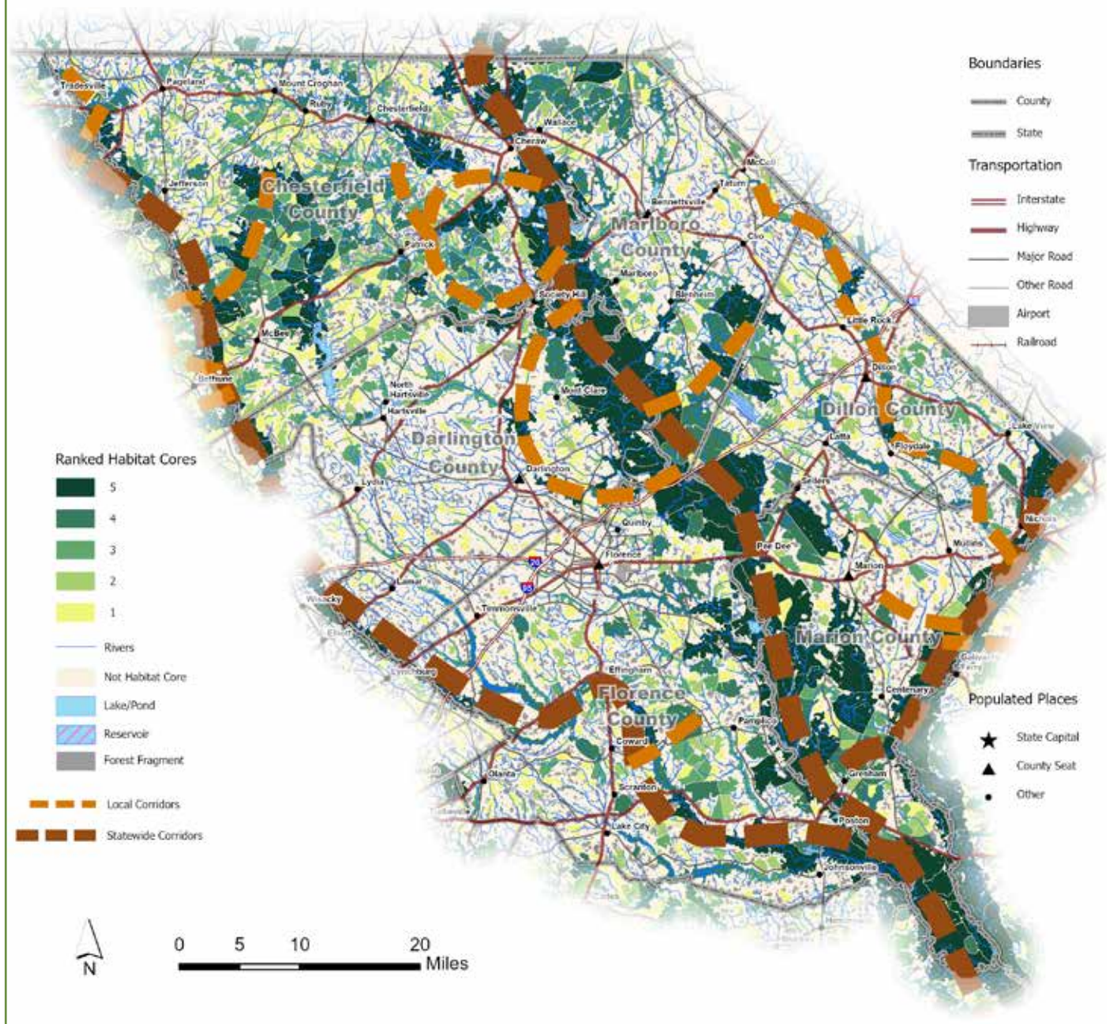
The purpose of this project was to identify and prioritize those green infrastructure assets that most urgently require protection or restoration in the state. The strategies and maps of habitat cores, corridors, assets, risks, and priorities provide a roadmap and shared vision for conservation and restoration efforts of state agencies, counties, cities, and landowners. Moving forward, agencies, planners, and citizens can view and download these priorities, maps, and data through the HUB site GIC has created in partnership with Esri. Additionally, the GIS datasets have been disseminated to all the agencies, municipalities, and organizations involved in this project to use in land use decisions and conservation planning. https://scgiplan-gicinc.hub.arcgis.com/

Forest in the Pee Dee Region

Maps

View all these maps on line and download habitat core data at:
https://scgiplan-gicinc.hub.arcgis.com/

Pee Dee Strategic Planning Map: Ranked Habitat Cores and Corridors



Habitat cores are intact natural landscapes large enough to support interior forest or marsh dwelling species. This map depicts the region's habitat cores and shows them connected by corridors to form a network. The more connected the landscape, the more resilient it is and the more pathways there are for people, pollinators, and plants. The habitat cores are ranked based on ecological metrics, with dark green representing the highest quality habitat cores and yellow representing the lowest quality habitat cores. A ranking of 5 is the best and 1 is the lowest. Additionally, statewide and regional wildlife corridors are represented on this map by brown dashed lines.

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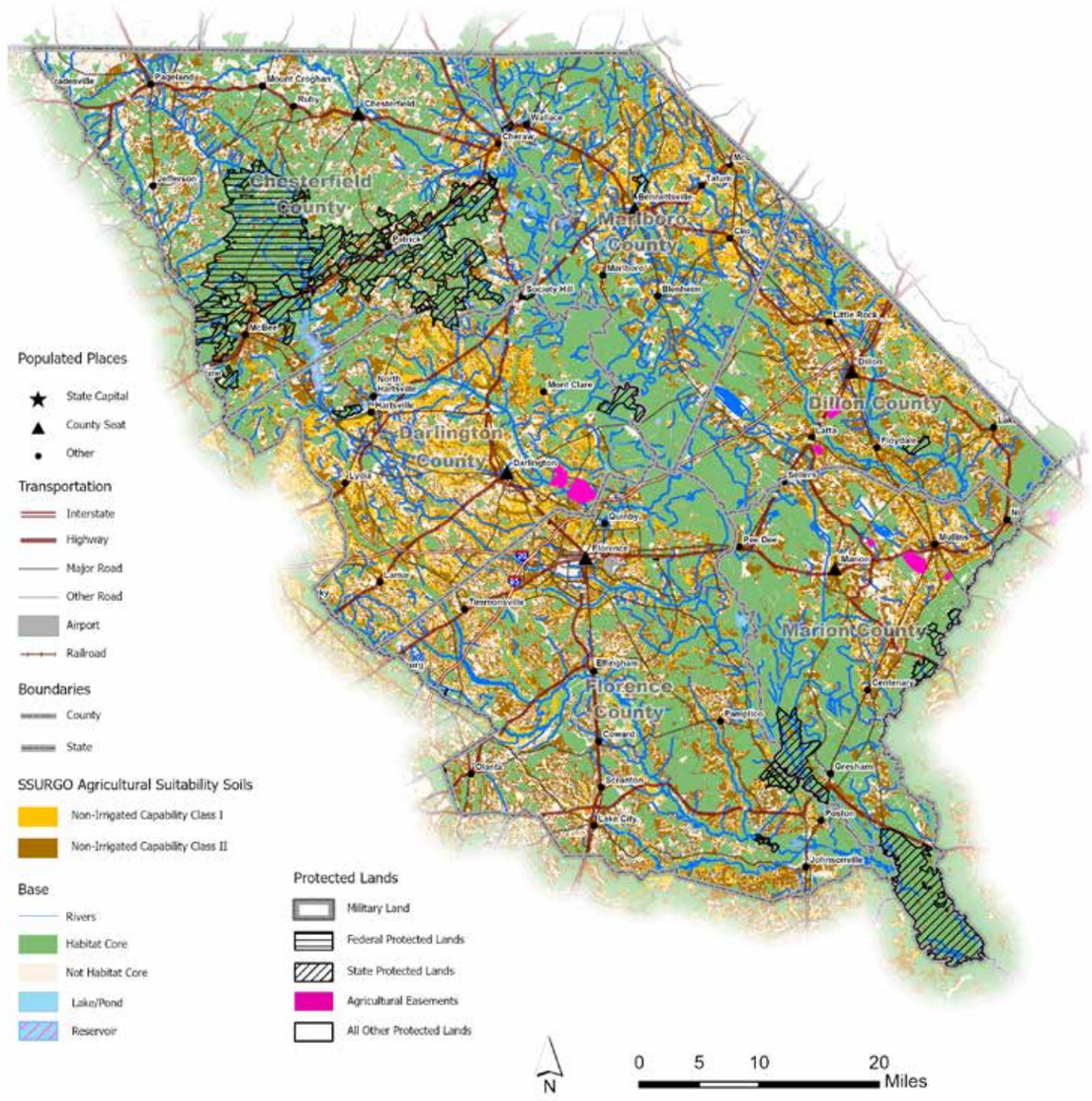
Pee Dee Assets: Agriculture Map



This map identifies the highest quality agriculture soils (classes 1 and 2) on open land, as well as agricultural easements in the region.

Pee Dee Assets: Water Map

This map depicts drinking water reservoirs, surface water intakes, groundwater protection zones, and the 100-year floodplain in the Pee Dee region. The many forests and wetlands in the region help cleanse runoff to protect surface water quality and provide groundwater recharge.

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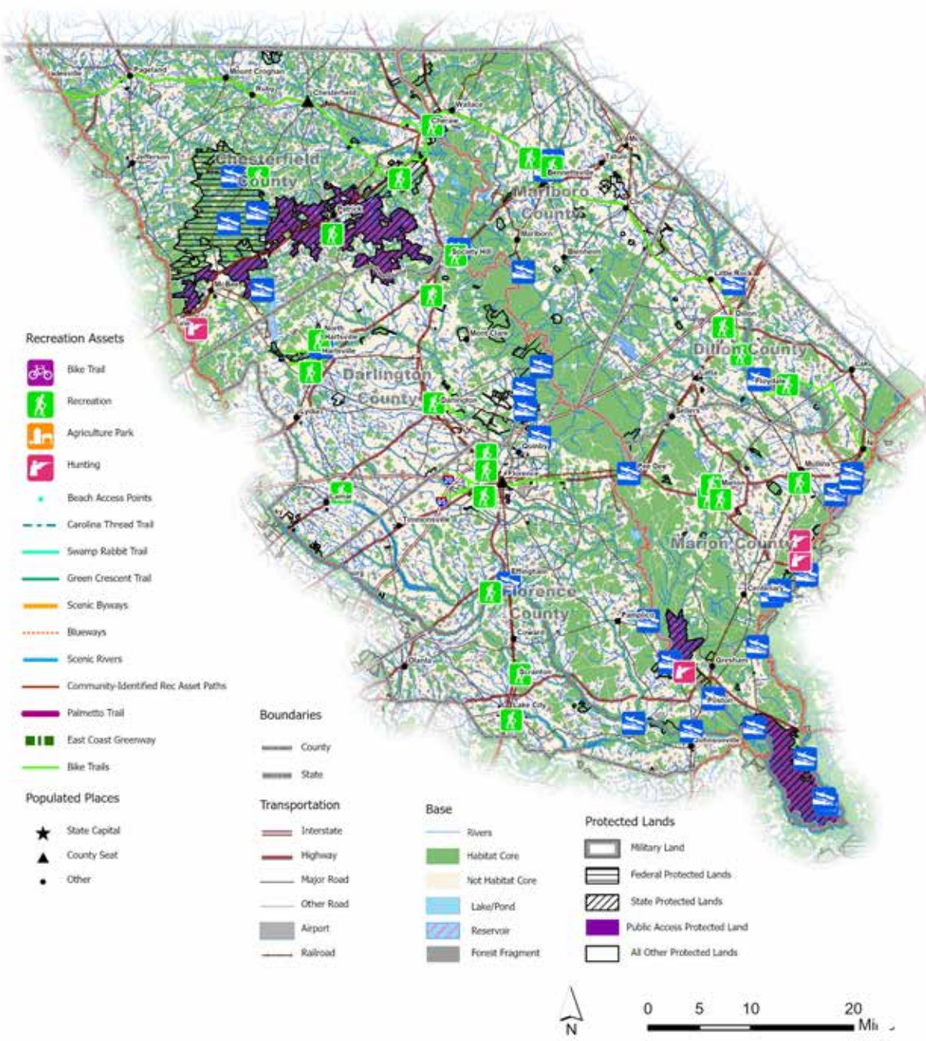
Pee Dee Assets: Recreation Map



This map depicts boat ramps, blueways, scenic rivers, scenic highways, greenways, Wildlife Management Areas, and federal, state, and local parks over 10 acres in the Pee Dee region. Many recreational activities depend on a healthy landscape for their enjoyment, such as hiking, birding, boating, fishing, hunting, and other nature-based sports. A healthy landscape provides both access and scenic settings for enjoying the outdoors. Large intact habitats provide refuge, shelter, and food for the many species that residents and tourists appreciate when enjoying the outdoors.

Pee Dee Assets: Culture Map

This map displays historic sites, Native Peoples sites, cultural overlay districts, scenic highways, scenic rivers, and waterfalls in the Pee Dee region. Natural landscapes provide the context, backdrops, and buffers for these sites and contribute to their settings and beauty.

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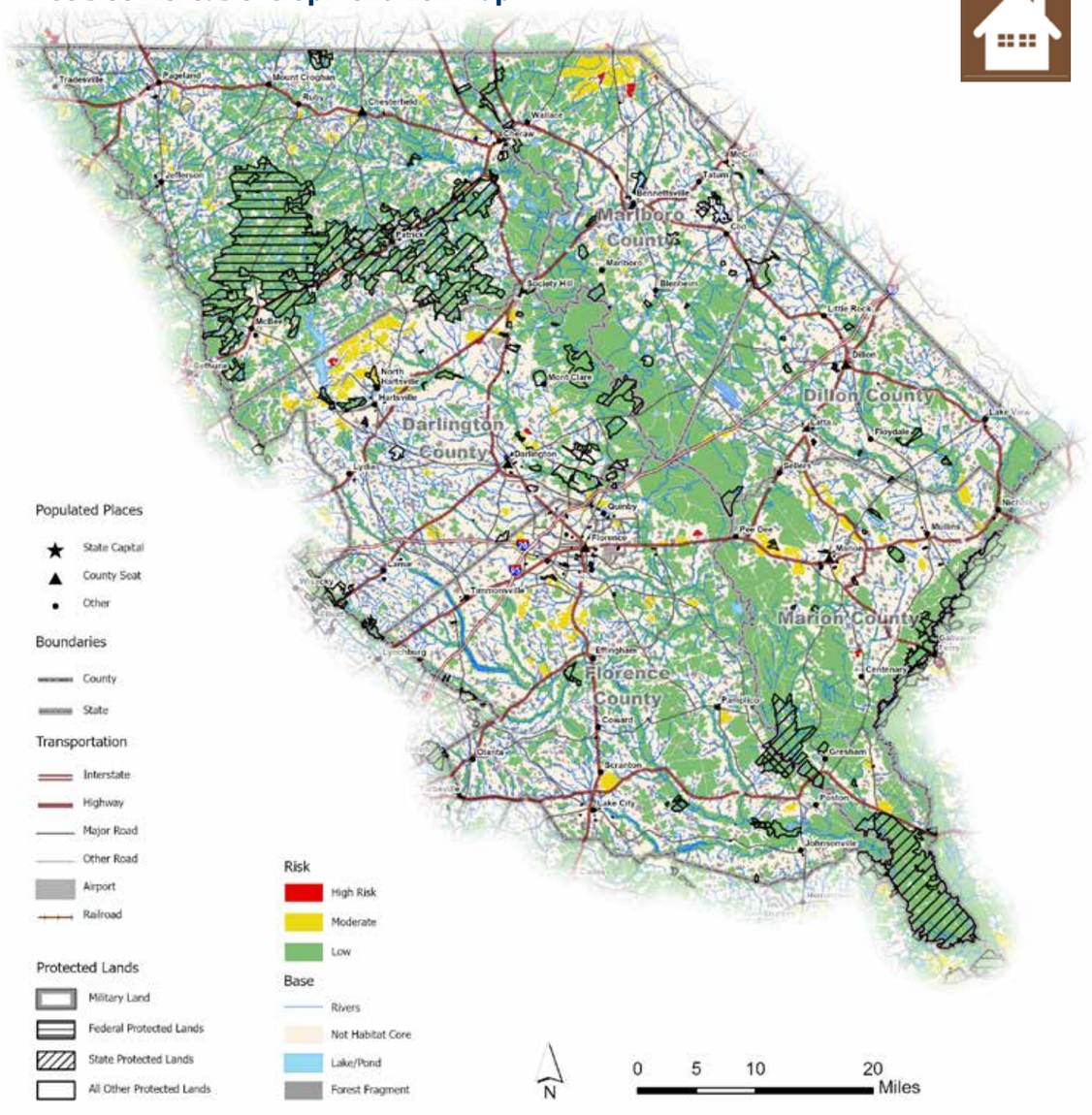
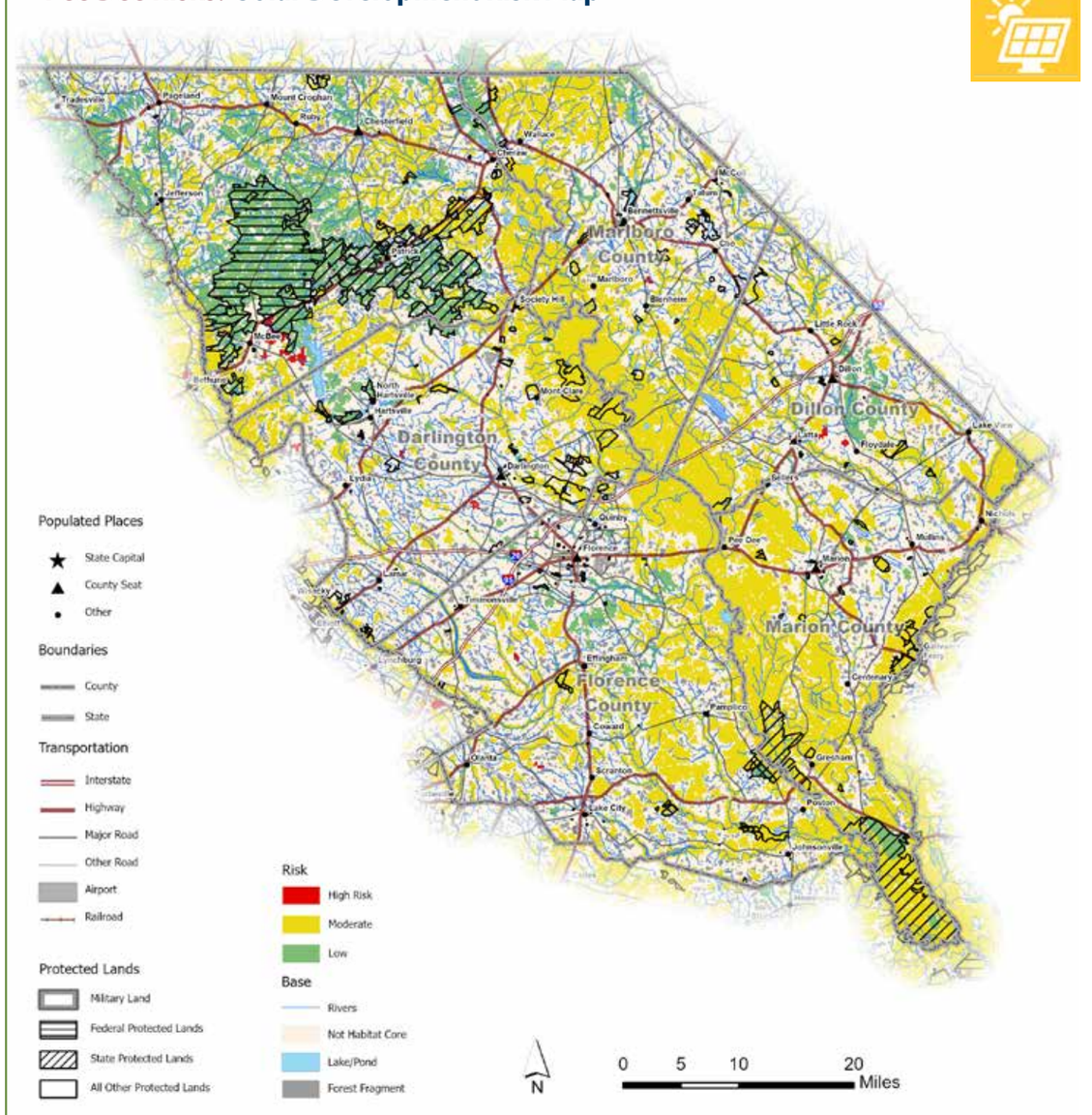
Pee Dee Risks: Development Risk Map



This map depicts the level of development risk based on the SLEUTH Urban Growth Model projected to the year 2060, with protected lands excluded.

Pee Dee Risks: Solar Development Risk Map



This map depicts the level of solar development risk based on Argonne Lab's Solar Site Suitability Analysis, with wetlands and protected lands excluded.

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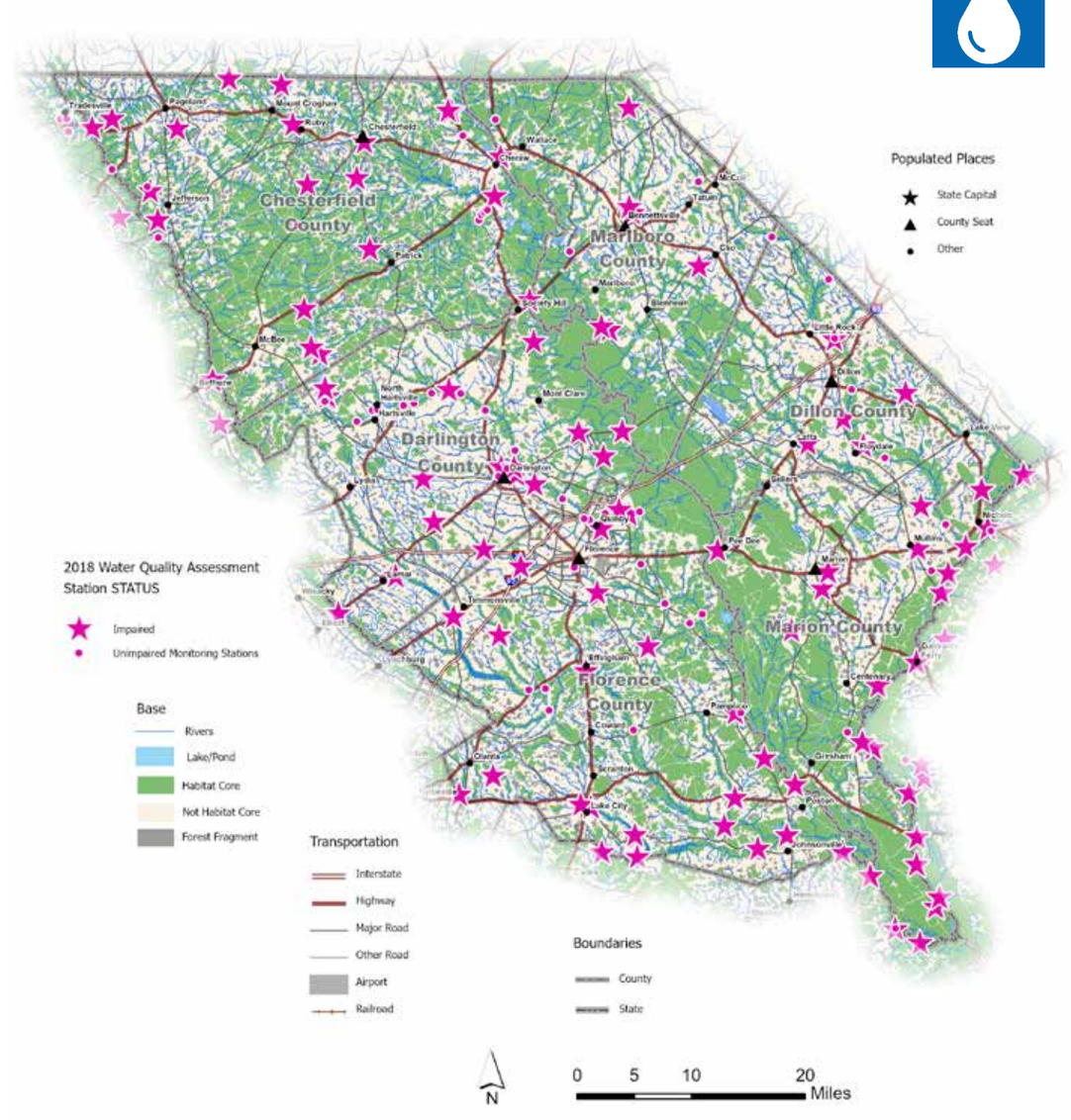
Pee Dee Risks: Water Quality Impairments Map



This map depicts water quality assessment sites and specific impairments across the region, and includes SC DHEC Water Quality Assessment data.

Notes

*Native people of the Pee Dee region as shown on Native Land Map:
Disclaimer from https://native-land.ca/
This map does not represent or intend to represent official or legal boundaries of any Indigenous Nations.
To learn about definitive boundaries, contact the nations in question.

Acknowledgments

Publication Date: March 2023. This guide may be downloaded and printed. All images, graphics and maps in this report are by the Green Infrastructure Center Inc. unless otherwise credited.

Contributing authors to this report include the following Green Infrastructure Center staff: Lauren Doran, Matt Lee, and Karen Firehock; maps are by Stuart Sheppard and Christian Schluter; editing by Tim Lewis.

To obtain any materials presented in this report please contact:
GIC, 320 Valley St., Scottsville VA 24590-4996: Tel: 434-286-3119.
Or visit our website for resources at: http://www.gicinc.org